

**METHOD FOR IMPROVING THE TBC LIFE  
OF A SINGLE PHASE PLATINUM ALUMINIDE BOND COAT  
BY PREOXIDATION HEAT TREATMENT**

**ABSTRACT**

A thermal barrier coating system having an improved life as a result of a preoxidation treatment applied to a single phase platinum aluminide bond coat. After coating the substrate to form a diffusion platinum aluminum bond coat, the surface finish of the bond coat was grit blasted with an inert grit of preselected size at a preselected pressure to achieve a predetermined surface finish. After the grit blasting, but before application of the ceramic top coat of yttria-stabilized zirconia (YSZ), the coating was preoxidized to form a thin alumina scale by heat treating the diffusion platinum aluminide bond coat at an elevated temperature at a preselected partial pressure of oxygen.